

**FIELD EMISSION DEVICE HAVING INSULATED COLUMN
LINES AND METHOD OF MANUFACTURE**

5 Abstract of the Disclosure

An FED and a method of manufacture are provided. The FED includes a cathode assembly containing an improved column line structure. The column line structure includes a conductive structure formed on a substrate. A resistive layer is formed on the conductive structure, and an insulator layer is formed partly over the resistive layer. The contact between the base of the emitter tips and the addressing column line is achieved through a lateral side that is not covered by the insulator layer. The insulator layer helps reduce the possibility of electrical shorting between the addressing column line and the row line structure of the cathode assembly. The insulator layer on top of the addressing column line will allow the use of a thinner subsequent dielectric layer. This thinner dielectric layer, which supports the grid, will provide a lower RC time constant and help achieve better video rate operation. The thinner dielectric layer also will result in smaller grid openings above the tips. This will provide for better beam spots, and, therefore, better image resolution. The thinner dielectric layer will require less applied voltage to extract electrons from the tips, resulting in lower power consumption for the FED.